

VAN DER PASCH et al. -- 10/813,682
Attorney Docket: 081468-0308989

REMARKS

Claims 1-22 are pending. By this Amendment, the specification is amended and claim 12 is amended. Reconsideration in view of the above amendments and the following remarks is respectfully requested.

Claims 1-3 and 12-14 were rejected under 35 U.S.C. §102(b) over Hill (U.S. Patent 6,137,574). The rejection is respectfully traversed.

Claim 1 recites a lithographic apparatus comprising a radiation source configured to provide radiation to an illumination system. The radiation source is configured to provide radiation in a first wavelength range and in a second wavelength range. The second wavelength range is different from the first wavelength range. A support is configured to support a patterning device. The patterning device is configured to impart the radiation with a pattern in its cross-section. A substrate table is configured to hold a substrate. A projection system is configured to project the patterned radiation onto a target portion of the substrate.

The Office Action alleges on page 2, paragraph number 1, that Hill discloses a lithographic apparatus and method shown in Figure 1. It is respectfully submitted, however, that Hill does not disclose or suggest a lithographic apparatus and method in Figure 1. Hill does disclose a lithographic apparatus in Figures 11A and 12. However, for reasons discussed in detail below, the lithographic apparatus shown in Figures 11A and 12 of Hill also fails to anticipate or render obvious claim 1.

What Hill discloses in Figures 1A-1F is an interferometry system that uses a phase shifter. A source 1 provides a light beam 7 that passes through a modulator 3 to provide a light beam 9 with a suitable diameter and divergence for the elements of the interferometry system that follows. See column 18, lines 52-59. The light beam 9 is split by a beam splitter 73 into a beam 33 and a beam 34 that are provided to an interferometer 69 and a detector system 89. See column 19, lines 3-6.

As discussed above, there is no disclosure or suggestion by Hill in Figure 1A of a lithographic apparatus. The device shown in Figure 1A is an interferometry system, not a lithographic apparatus. There is no support configured to support patterning device, nor is there a patterning device configured to impart any of the beams shown by Hill in Figure 1A with a pattern in its cross section. There is also no disclosure or suggestion by Hill in Figure 1A of a substrate table configured to hold a substrate or projection system configured to project patterned radiation onto a target portion of a substrate.

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With respect to the allegation that Hill's source 1 is configured to provide radiation in a first wavelength range and a second wavelength range, there is no disclosure or suggestion by Hill of radiation provided in first and second wavelengths.

Hill discloses nine additional embodiments and variations thereof of an interferometry system in Figures 2A-10. The embodiments shown in Figures 5A, 6A, 7, 8 and 9A each include two sources that provide light beams having different wavelengths. However, as discussed above, the embodiments shown in Figures 2A-10 of Hill are interferometry systems, not lithographic projection apparatus. Accordingly, Hill does not disclose or suggest in these embodiments that the radiation is patterned by a patterning device nor does Hill disclose or suggest in these embodiments a projection system that projects patterned radiation onto target portion of the substrate.

The lithographic apparatus shown in Figure 11A of Hill discloses a radiation beam 1110 that is provided to a beam shaping optics assembly 1112, but there is no disclosure or suggestion by Hill that the lithographic projection apparatus of Figure 11A includes a radiation source configured to provide radiation to an illumination system, the radiation source being configured to provide radiation on the first wavelength range and a second wavelength range, wherein the second wavelength range is different from the first wavelength range. Accordingly, none of the embodiments of the interferometry system or the lithographic apparatus of Hill anticipate or render obvious claim 1.

Claims 2 and 3 recite additional features of the invention and are allowable for the same reasons discussed above with respect to claim 1 and for the additional features recited therein.

Claim 12 recites a device manufacturing method including providing radiation in a first wavelength range and at a second wavelength range. The second wavelength range is different from the first wavelength range. The method further includes patterning the radiation in its cross section and projecting the patterned radiation onto a target portion of the substrate.

As discussed above, none of the embodiments of the interferometry systems or lithographic apparatus of Hill disclose or suggest patterning radiation that is provided in a first wavelength range and a second wavelength range in its cross section and projecting the patterned radiation onto a target portion of the substrate. Accordingly, none of the embodiments of the interferometry system or the lithographic apparatus of Hill can anticipate or render obvious claim 12.

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Claims 13 and 14 recite additional features of the invention and are allowable for the same reasons discussed above with respect to claim 12 and for the additional features recited therein.

Reconsideration and withdrawal of the rejection of claims 1-3 and 12-14 over Hill are respectfully requested.

Claim 5-8, 11, 16-19 and 22 were rejected under 35 U.S.C. §103(a) over Hill. The rejection is respectfully traversed.

Claims 5-8, 11, 16-19 and 22 recite additional features of the invention and are allowable for the same reasons discussed above with respect claims 1 and 12, respectively, and for the additional features recited therein.

With respect to the allegations on page 3, paragraph number 4, that Hill inherently encompasses all the limitations of claims 5-8, 11, 16-19 and 22 because Hill's radiation source is not restricted to one wavelength range only, it is respectfully submitted that Hill does not disclose or suggest that the radiation sources shown in the 10 embodiments of the interferometry systems includes the entire wavelength range as alleged by the Examiner. As discussed above, in the embodiments shown in Figures 1A-4, Hill discloses a single source providing a light beam having a single radiation wavelength. In the embodiments shown in Figures 5A-9A, Hill discloses two sources that provide two light beams having two radiation wavelengths, respectively. There is no disclosure or suggestion by Hill that the sources used in the interferometry systems include the entire wavelength range, as alleged by the Examiner.

In addition, it is respectfully submitted that the Examiner has not met the burden set forth in MPEP §2112 in order to rely upon the theory inherency. In particular, the Examiner has provided no basis in fact and/or technical reasoning that Hill's radiation source and sources provide radiation in the entire wavelength range from X-ray to UV as alleged. Hill discloses in column 71, lines 62-65, that during operation of the lithographic apparatus shown in Figure 11A, the radiation beam 1110 is a UV beam from a UV laser. Hill does not disclose or suggest that the UV laser provides radiation having a wavelength that encompasses the entire range from X-ray to UV. In fact, it is respectfully submitted that the UV laser disclosed by Hill provides only UV radiation, i.e., radiation in only a first wavelength range, not in a first wavelength range and a second wavelength range as claimed.

With respect to the Examiner's reliance on the case law cited on page 4, lines 8-12, as the Examiner has not specified which elements or steps from Hill's "versatile and

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complicated system or method" would be eliminated by one of ordinary skill in the art, it is respectfully submitted that the Examiner has not presented a *prima facie* case of obviousness. In addition, it is respectfully submitted that the Examiner has not met test required for reliance on the rationale used by the court in the case law cited as required by MPEP §2144.04:

Reconsideration and withdrawal of the rejection of claims 5-8, 11, 16-19 and 22 over Hill are respectfully requested.

Claims 4, 9, 15 and 20 were rejected under 35 U.S.C. §103(a) over Hill in view of Li (U.S. Patent 5,926,298) or Kawakubo (U.S. Patent 6,219,130) or Tenimoto et al. (U.S. Patent 4,870,452) or (Nishi (U.S. Patent 5,138,176) or Nakagawa et al. (U.S. Patent 5,184,196) or Nara et al. (U.S. Patent 5,850,279). The rejection is respectfully traversed.

The Office Action on page 4, paragraph number 5, alleges that Hill discloses all the limitations of claims 4, 9, 15 and 20 except for the recitation of specific limitations that are allegedly disclose in one of the numerous secondary prior art references applied against the claims. It is respectfully submitted that, however, as discussed above, Hill does not disclose all the limitations of claim 1 or claim 12. Hill discloses ten embodiments of an interferometry system in which four of the embodiments use a single source providing a light beam having a wavelength in a first range only and six embodiments in which two sources provide two respective light beams having wavelengths in a first and second range, respectively. The ten embodiments of the interferometry system of Hill do not disclose or suggest, however, patterning devices that pattern the radiation nor a projection system that projects the patterned radiation.

It is respectfully submitted that each of the secondary prior art references cited in the Office Action fail to cure the deficiencies of Hill, and even assuming it would have been obvious to any one of, or all of, the secondary prior art references with Hill, such combinations would not result in the inventions of claims 1 and 12.

Li is non-analogous prior art as it is neither in Applicants' field of endeavor nor relevant to the particular problems with which Applicants were concerned.

Kawakubo discloses a position detecting apparatus used with an exposure apparatus for projecting a mask patterned onto a substrate. However, Kawakubo does not disclose or suggest a source that provides radiation in a first wavelength range and a second wavelength range, wherein the second wavelength is different from the first wavelength. Kawakubo also

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does not disclose or suggest a patterning device that patterns the radiation nor a projection device that projects the pattern radiation.

Tanimoto et al. disclose an excimer laser 1 and a He-Ne laser 10. Tanimoto et al. do not disclose or suggest a radiation source configured to provide a radiation in a first wavelength range and a second wavelength range, the second wavelength range being different than first wavelength range.

Nishi discloses a projection optical apparatus equipped with a different wavelength TTR (through the reticle) alignment system which can detect and correct an alignment offset attributable to, particularly, a distortion with high precision. However, Nishi does not disclose or suggest a radiation source configured to provide a radiation in a first wavelength range and a second wavelength range, the second wavelength range being different than the first wavelength.

Nakagawa et al. disclose a projection exposure apparatus including a light source 1 and a laser light source 10. Nakagawa et al. do not disclose or suggest a radiation source configured to provide a radiation in a first wavelength range and a second wavelength range, the second wavelength range being different than the first wavelength range.

Nara et al. disclose a first illuminating means for radiating a light beam having a first wavelength and a second illuminating means for radiating light beam having a second wavelength. However, Nara et al. do not disclose or suggest a radiation source configured to provide radiation in a first wavelength range and a second wavelength, the second wavelength range being different than the first wavelength range.

Reconsideration and withdrawal of the rejection of claims 4, 9, 15 and 20 over Hill in view of the applied second prior art reference are respectfully requested.

Claims 10 and 21 were rejected under 35 U.S.C. §103(a) over Hill in view of Stryer et al. (U.S. Patent Application Publication 2002/0064796 A1). The rejection is respectfully traversed.

Claim 10 and 21 recite additional features of the invention and are allowable for same reasons discussed above with respect to claims 1 and 12, respectively, and for the additional features recited therein. In addition, it is respectfully submitted that Stryer et al. fail to cure the deficiencies of Hill with respect to claims 1 and 12, and even assuming it would have been obvious to combine the references, such a combination would not result in the inventions of claims 1 and 12.

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Reconsideration and withdrawal of the rejection of claims 10 and 21 are respectfully requested.

Claim 1 was rejected under the judicially created doctrine of obviousness-type double patenting over claim 1 of U.S. Application 10/792,909 (U.S. Patent Application Publication 2005/0110965 A1). The rejection is respectfully traversed.

It is respectfully submitted that the Examiner has failed to present a *prima facie* case of obviousness type-double patenting as the Examiner has not identified any differences between claim 1 of the instant application and claim 1 of U.S. Application 10/792,909, nor has the Examiner identified any reason why the differences would have been obvious to one of ordinary skill in the art. It is respectfully submitted that simply alleging that claim 1 of the instant application is broader than claim 1 of U.S. Application 10/792,909 fails to present a *prima facie* case. The Examiner is respectfully requested to perform the analysis required in MPEP §804 II.B.1 to establish a *prima facie* case of obviousness type-double patenting, or withdraw the rejection.

Claim 2 was rejected under the judicially created doctrine of obviousness type-double patenting over claim 1 of U.S. Application 10/925,214 (U.S. Patent Application Publication 2005/0078292 A1). The rejection is respectfully traversed.

It is respectfully submitted that claim 2 of the instant application does not include all the same limitations as claim 1 of U.S. Application 10/925,214, as alleged on page 9, paragraph number 9, of the Office Action. Claim 1 of U.S. Application 10/925,214 recites an adjustable filter comprising a portion of the illumination system and constructed and arranged to filter the beam of radiation and being arranged in use to selectively adjust a proportion of the second radiation component relative to the first radiation component in the beam.

Claim 2 of the instant application recites that the radiation source further comprises a removable filter configured to provide the radiation and the first or second wavelength range. There is no recitation in claim 2 of the instant application that the removable filter is adjustable, as recited in claim 1 of U.S. Application 10/925,214. In addition as discussed above, claim 2 of the instant application recites that the filter is in the radiation source, whereas claim 1 of U.S. Application 10/925,214 recites that the adjustable filter comprises a portion of the illumination system. As the Examiner provided no reasons why these differences would have been obvious to one of ordinary skill in the art, it is respectfully submitted that the rejection fails to present a *prima facie* case of obviousness type-double patenting.

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In view of the above amendments and remarks, Applicants respectfully submit that the all the claims are allowable and that the entire application is in condition for allowance.

Should the Examiner believe that anything further is desirable to place the application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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